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which are filled with mud ; after washing out the mud, about one-third of the volume remains as a glittering mass ("Glaswolle").

A detailed report on the peculiarities of this deep-sea fauna will be given in a separate work entitled *Fauna Arctica*, and will be, no doubt, one of the most interesting additions to our knowledge of the Arctic faunas.

A. E. O.

Arctic Marine Animals. — The material collected by the Princeton Expedition to North Greenland in 1899 has been sorted out, and part of it has been identified. It proves to be the largest collection of Arctic marine life ever made in the neighborhood of Inglefield Gulf and Smith Sound. Of the animals reported by former expeditions (Hayes, Nares, Peary Expedition of 1894), nearly every species is represented in the collection, while many additional species were taken which have not yet been recorded from these parts.

The chief value of this collection lies on the zoögeographical side, adding new localities to the known range of Arctic forms from parts hitherto almost unknown. These localities, situated so far north ($76-79^{\circ}$), will be very valuable in the construction of a connection between many species now known from the Atlantic and Pacific parts of the Arctic seas. Some species seem to be truly circumpolar in distribution, while in others the connection seems to be interrupted. For the establishment of such cases an investigation of the fauna of this region as well as that of the northern coast of Siberia is necessary, and the collections of the Princeton Expedition to North Greenland, when published, will, in this respect, add considerably to our knowledge.

A. E. O.

Notes. — Dr. Thiele reports in *Fauna Arctica* a new solenogaster, *Proneomenia thulensis*, found by the German Arctic Expedition of 1898. It is characterized by a radula with many small teeth and by a multifid receptaculum.

In the Munich *Sitzungsberichte* Mr. A. M. Przesmycki reports his success in staining the nucleus of living *Opalina* and *Nyctotherus* with neutral red. The chromatin elements show the deeper color, and the phases of nuclear division may be watched in the living organism.

Text-books of zoölogy have made the statement that the mouth in the Infusoria is formed by the simple division of the parental organ. In the Heidelberg *Verhandlungen* Dr. A. Schuberg describes the origin of the peristomal region of *Euplotes patella* as a series of

extensive and complicated growth processes in which no simple plane of division can be recognized.

An interesting prorhynchid turbellarian from deep wells in New Zealand has been described by Haswell (*Quart. Journ. Micr. Sci.*, Vol. XL, pp. 631-645, Pl. XLVIII). It is most closely related to the Prorhynchidæ and not to the Alloiocœla, as at first believed. The complicated pharynx, the lateral vitello-germarium, and the unpaired lateral testis are among the important peculiar structural features of this form which the author includes provisionally in the genus Prorhynchus.

In an extended study of the morphology and physiology of *Euglena gracilis*, Zumstein (Inaugural-Dissert., Basel, 1899) shows that this species does not manifest anything of an animal method of life. Its nutrition may be purely holophytic, purely saprophytic, or both combined, but thrives best under the latter. The colorless variety of the species may be transformed into the green, or *vice versa*, with corresponding change in manner of nutrition.

The frequency of trematodes has been studied by Hausmann (*Centralbl. f. Bakt. u. Par.*, I. Abth., Bd. XXVI, pp. 447-453) in birds from Baden and the vicinity of Basel. The percentage of infection found was, Grallatores 29, Raptatores 26, Natatores 25, Corvidæ 24, which is from three to six times as large as numbers previously listed from birds.

Number IX of the third volume of the *American Journal of Physiology* contains the following articles: "On the Reactions of Chlomonas to Organic Acids," by H. S. Jennings; "Notes on the Individual Psychophysiology of the Crayfish," by G. V. N. Dearborn; "On the Artificial Production of Normal Larvæ from the Unfertilized Egg of the Sea Urchin," by J. Loeb; and "On the Maximum Production of Hippuric Acid in Rabbits," by W. H. Parker and G. Lusk.

In a reply (*Archiv f. die ges. Physiologie*, Bd. LXXIX, 1900) to a criticism of his paper on the psychic qualities of ants and bees, Albert Bethe tells us that the chief error in his work is that he did not distinguish clearly enough between objective expression and subjective "Empfindung" in our own psychological processes. He says that he agrees with Uexküll that the question concerning the Psyche of animals does not belong to the realm of exact science, and he declares that he is ever willing to discuss the question

whether or no ants and bees have the power to purposefully modify their acts (*Modifikationen vermögen besitzen*), and whether a "Remanenz" of a stimulus is possible in them. But whether they possess a psychical quality or not, he will not discuss, since the objective expressions of animals and the causes of these are all that legitimately belong to biological research.

W. E. R.

A supplementary part has been issued to Vol. XV of the *Journal of Morphology* and contains the following articles: "On Protoplasmic Structure in the Eggs of Echinoderms and some other Animals," by E. B. Wilson; "Studies upon the Early History of the Ascidian Egg," by H. E. Crampton; "The Spermatogenesis of *Amphiuma*," by J. H. McGregor; "The Calciferous Glands of the Earthworm, with Appendix on the Circulation," by N. R. Harrington; "The Changes in the Structure of the Pancreas Cell," by A. Mathews; and "The Spermatogenesis of *Anasa tristis*," by F. C. Paulmier. The supplement has a paging of its own, but is unaccompanied by a table of contents or title page.

BOTANY.

Phenological Observations in Canada. — Mr. A. H. Mackay¹ gives an account of some interesting phenological observations made in Canada during the seven years 1892 to 1898. This was one of the lines of work undertaken by the Botanical Club of Canada, and from nine to nineteen reports were received each year, giving more or less completely the time of the appearance of leaves, flowers, and fruits and the migration of birds. The author calls attention to the many difficulties of obtaining complete and accurate records; for example, the more rare species may easily escape notice until they have been in flower for some time. Again, some individual plants are earlier than others in the same locality, and in the same individuals certain branches are earlier than others, hence the records were made to include "first appearance" and "becoming common." A phenological date is defined as "a sort of mathematical function of variables," which is influenced by variations in temperature, of atmospheric pressure, sunshine, precipitation, together with the local constants, latitude, elevation, slope, proximity of bodies of water, and character of soil. The rapidity with which a season advances,

¹ *Canadian Record of Science*, vol. viii, pp. 71-84, 1900.